

Yellow birch

(*Betula alleghaniensis*)



Yellow birch is a **slow-growing, shade tolerant** species, found mainly in northern Wisconsin. The volume of yellow birch has increased 34% since 1983 but remained largely unchanged in the last decade. The number of seedlings has decreased since 1996 but the number of larger trees has increased.

The ratio of **growth to volume** is **below average** for all species and the ratio of **mortality to growth** is **above average**.

Yellow birch is **not an important timber species**, accounting for only 1% of roundwood production, mainly pulpwood. The density of yellow birch wood is very high making it a possibly valuable species for biomass production although there is not much volume.

- [*How has the yellow birch resource changed?*](#)
Growing stock volume and diameter class distribution: 1983, 1996, and 2012
- [*Where does yellow birch grow in Wisconsin?*](#)
Growing stock volume by region with map
- [*How fast is yellow birch growing?*](#)
Average annual net growth by region and year: 1983, 1996, and 2012
- [*How healthy is yellow birch in Wisconsin?*](#)
Average annual mortality: 1983, 1996, and 2012
- [*How much yellow birch do we harvest?*](#)
Roundwood production by product and year: 1997, 2003, and 2006
- [*How much is yellow birch selling for?*](#)
Prices for cordwood and sawtimber: 2000 to present
- [*How much yellow birch biomass do we have?*](#)
Aboveground carbon by region of the state: 2012

“How has the yellow birch resource changed?”
Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of yellow birch in Wisconsin in 2012 was approximately 263 million cft or about 1.2% of total statewide volume (Chart 1). This represents an increase of about 26% since 1983. Volume has **remained statistically unchanged since 1996**.

The yellow birch resource is aging as volume in large trees (over 13 inches diameter) has increased more than volume in small trees since 1996 (Chart 2).

Only the number of [saplings](#) increased between 1996 and 2012. Although the volume in large trees has increased, the number of pole and [sawtimber](#) trees has decreased by about 8%.

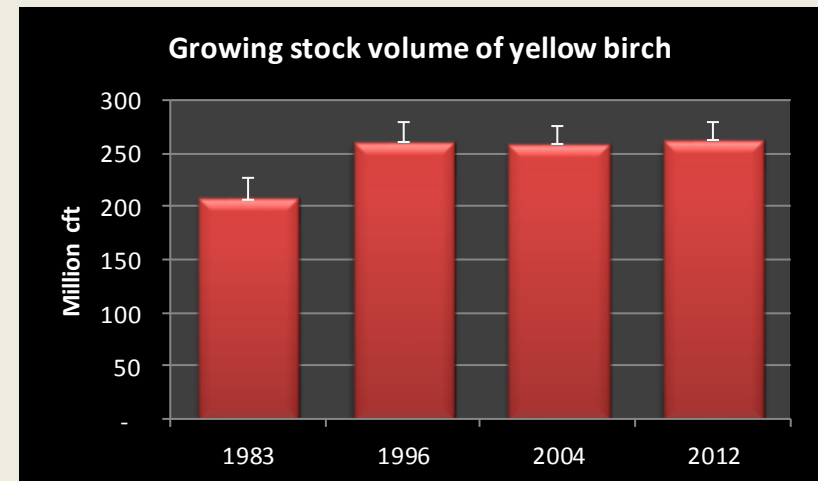


Chart 1. Growing stock volume (million cubic feet) by inventory year.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

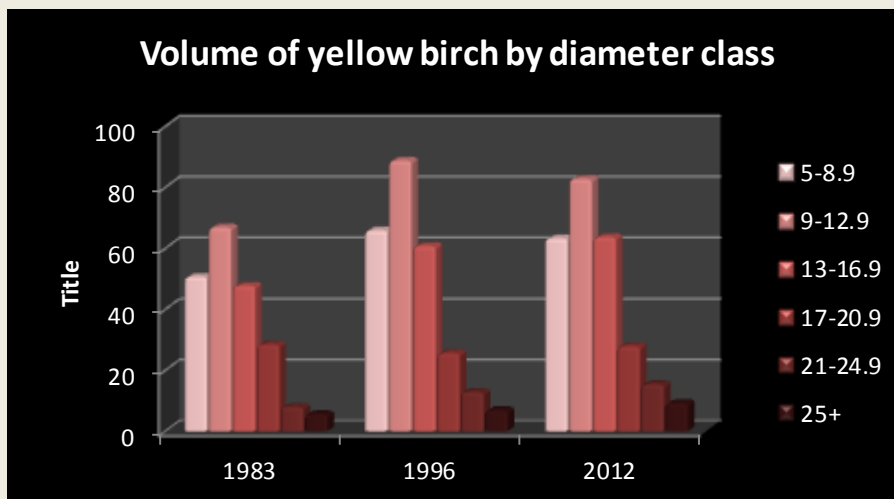


Chart 2. Growing stock volume (million cubic feet) in 1983, 1996, and 2012.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

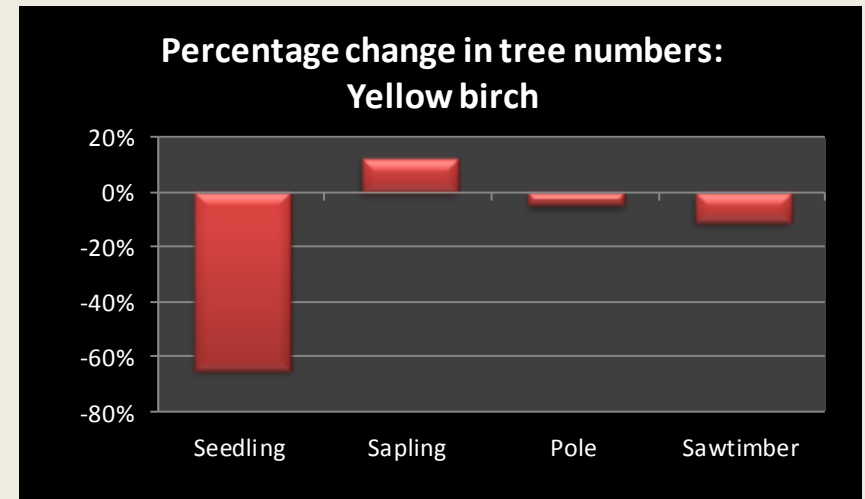
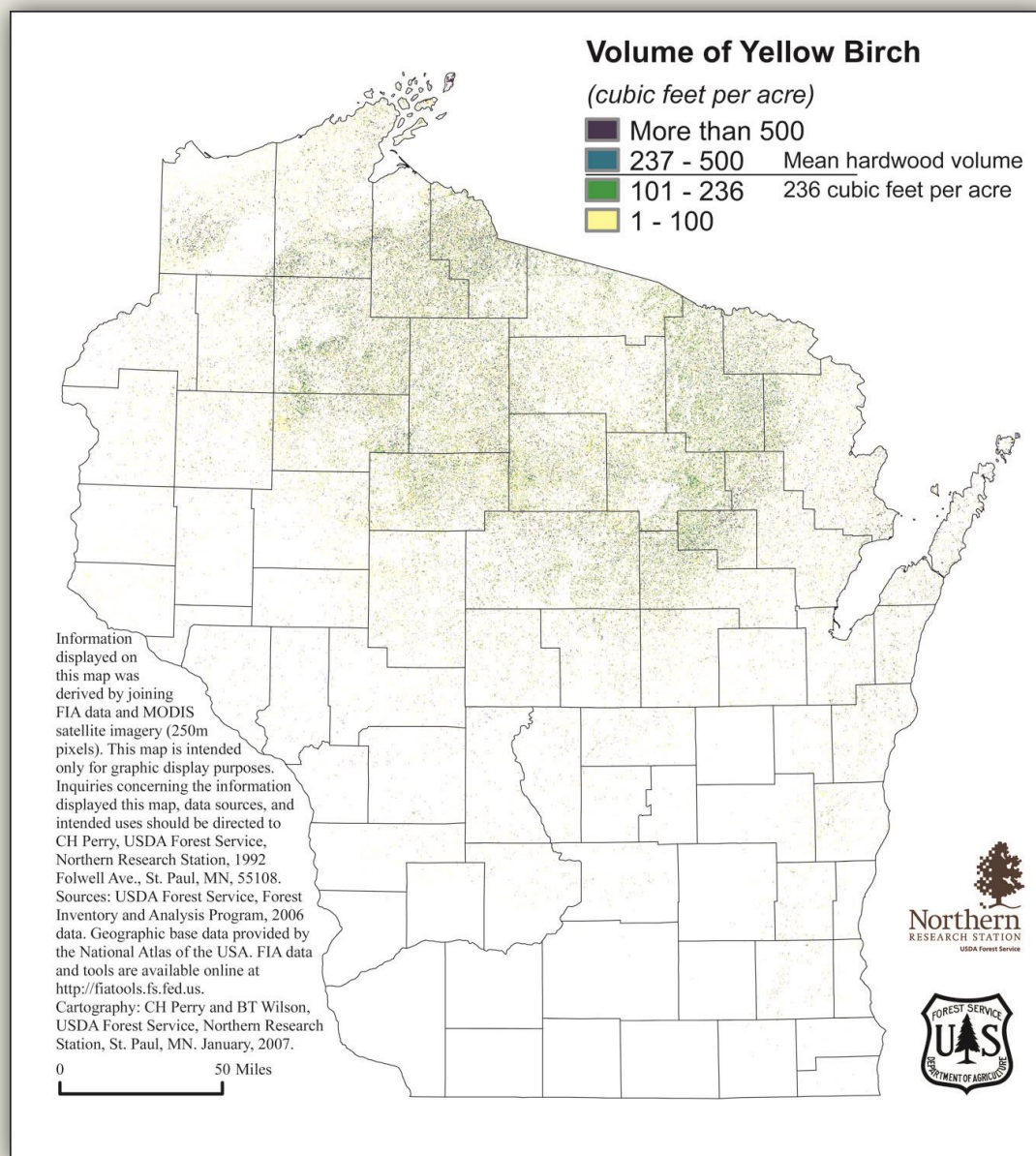


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2012.
 Source: USDA Forest Inventory and Analysis data 1996, and 2012.

"Where does yellow birch grow in Wisconsin?"

Growing stock volume by region with map



Yellow birch occurs mainly in northern Wisconsin with almost 90% of volume in the northern part of the state (Table 1).

The vast majority of yellow birch occurs on maple basswood [forest type](#) in the north. In the south, it can also occur on bottomland hardwood types.

Table 1. Growing stock volume (million cft) by species and region

Species	Central	North east	North west	South east	South west	Total
Yellow birch	25	97	126	12	2	263
Percent of total	9%	37%	49%	4%	1%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2012 data

For a table on **Volume by County for 2012** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf>



"How fast is yellow birch growing?"
Average annual net growth by region and year

Average annual net growth of yellow birch was about 2.6 million cft/yr from 2008 to 2012 (Chart 4), which represents 0.5% of statewide volume growth. Growth rates have more than doubled since 1996 .

Table 2. Average annual net growth (million cft/year) and ratio of growth to volume by region of the state.

Region	Net growth	% of Total	Ratio of growth to volume
Central	0.5	21%	2.2%
Northeast	1.0	37%	1.0%
Northwest	0.9	33%	0.7%
Southeast	0.1	5%	1.2%
Southwest	0.1	3%	3.6%
Statewide	2.6	100%	1.0%

Source: USDA Forest Inventory and Analysis 2012

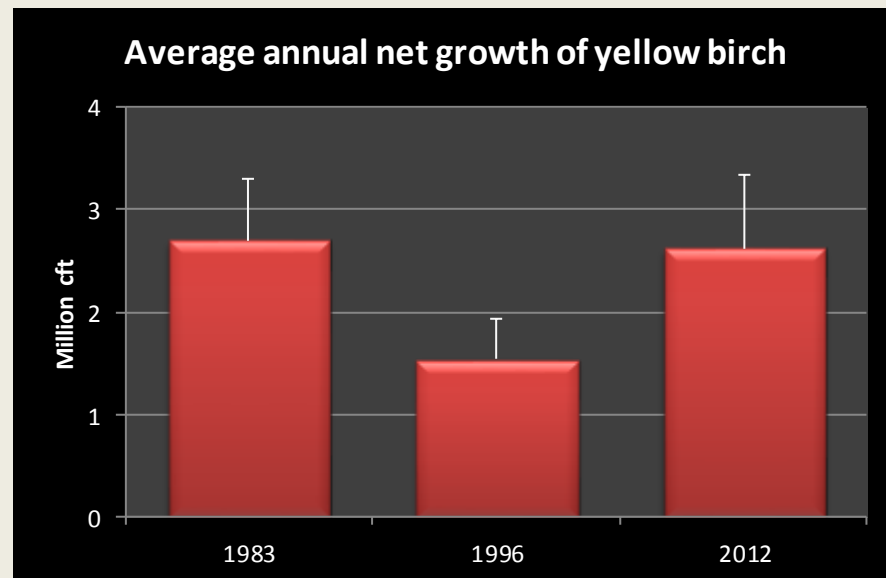


Chart 4. Average annual net growth (million cubic feet).
 Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2012

The highest volume growth for yellow birch is in the northern part of the state but the highest rates of net growth to volume are in central and southwest Wisconsin (Table 2). The average ratio of net growth to volume is 1.0%, much lower than the statewide average of 2.6% for all species.

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How healthy is yellow birch in Wisconsin?"

Average annual mortality: 1983, 1996, and 2012

Average annual mortality of yellow birch, about 3.3 million cft per year between 2008 and 2012, has remained statistically unchanged since 1983 (Chart 5). This represents about 1.4 % of total statewide mortality.

The ratio of mortality to gross growth is 55.8% for yellow birch, much higher than the statewide average of 28.8% for all species (Table 3). This is mainly a function of a growth rate which is much lower than other species.

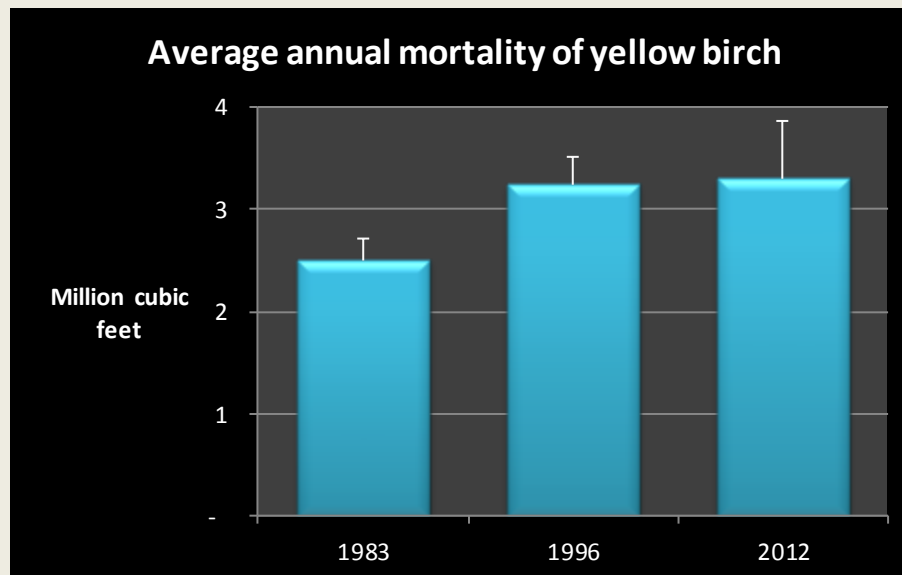


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

Table 3. Mortality, gross growth, and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Yellow birch	3,298,238	5,915,280	55.8%

Source: USDA Forest Inventory & Analysis data: 2012

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much yellow birch do we harvest?"

Roundwood production by product and year: 1997, 2002, and 2012

In 2009, yellow birch [roundwood](#), accounted for 3.7 million cft or about 1% of statewide production. Almost half was for pulpwood and $\frac{1}{3}$ in sawlogs (Chart 6).

From 2003 to 2009, yellow birch pulpwood production decreased by 38% while sawlog and veneer increased by about 10%

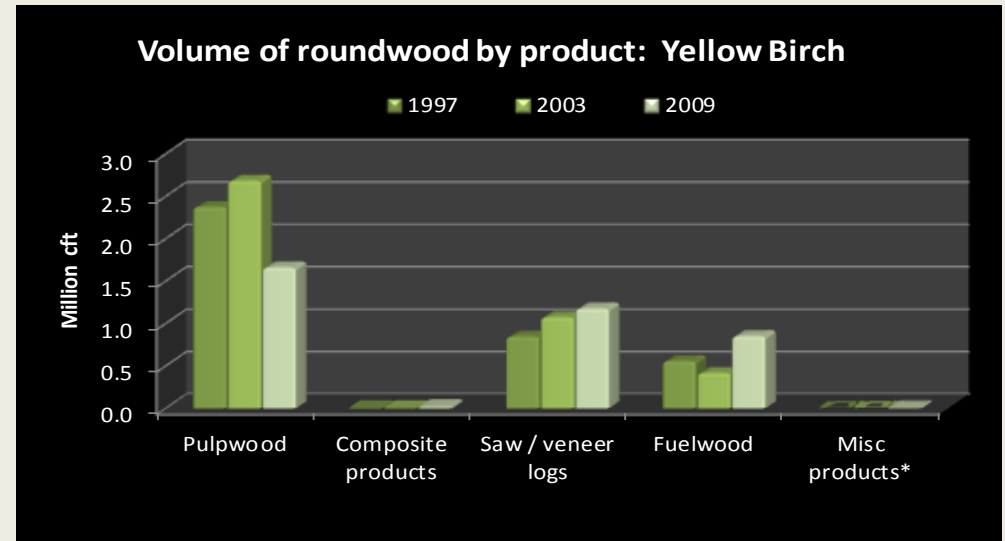


Chart 6. Volume of roundwood products. * Miscellaneous products include poles, posts, and pilings.
Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

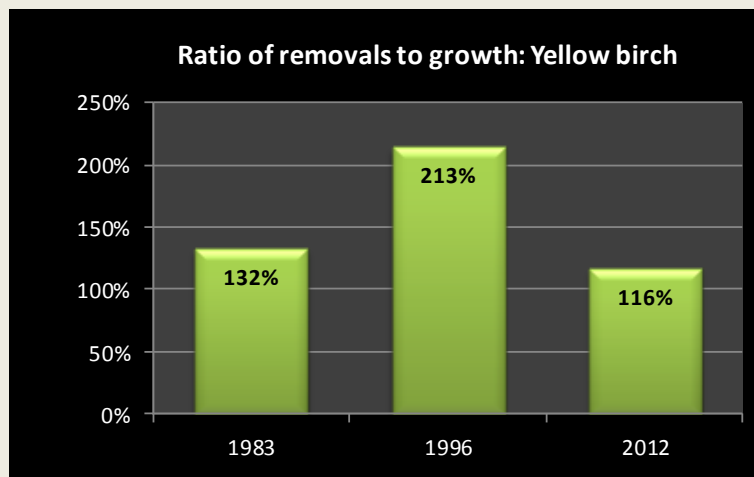


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012.

The ratio of removals to growth peaked in 1996 and has fallen since then. This is probably due to a major increase in growth rates, although low overall, for yellow birch plus a fairly constant level of harvest. However, due to high statistical error, it's difficult to draw accurate conclusions.

For a table of **Average annual growth, mortality and removals by region** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much is yellow birch selling for?"

Prices for cordwood & sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR 46.

Stumpage prices for sawtimber, as reported in the Timber Mart North (Chart 8), have been quite variable.

Average weighted stumpage values for sawlogs, as reported in NR46 (Table 4), peaked in 2004 and have declined since. Log prices are currently higher than the average for all hardwoods.

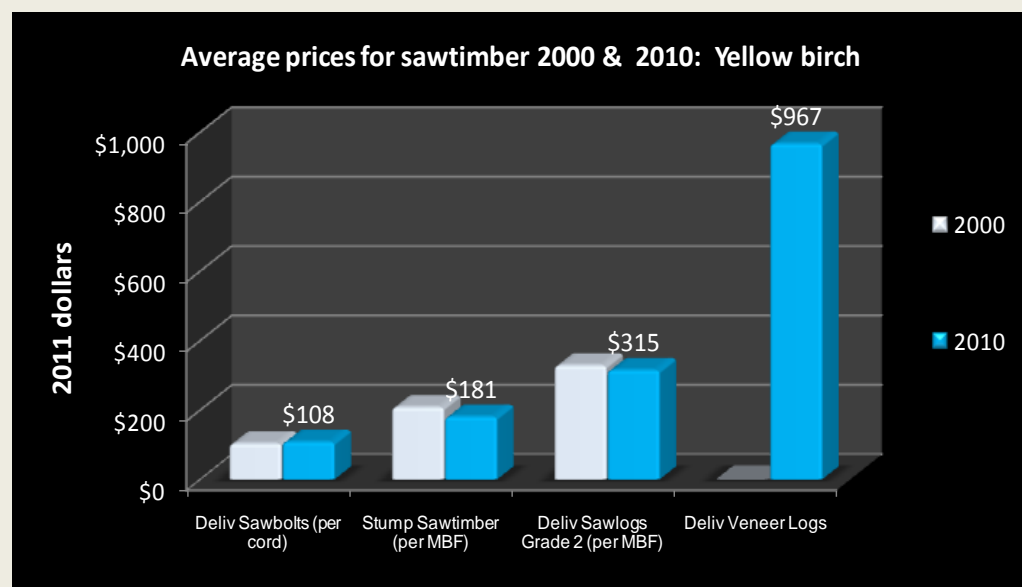


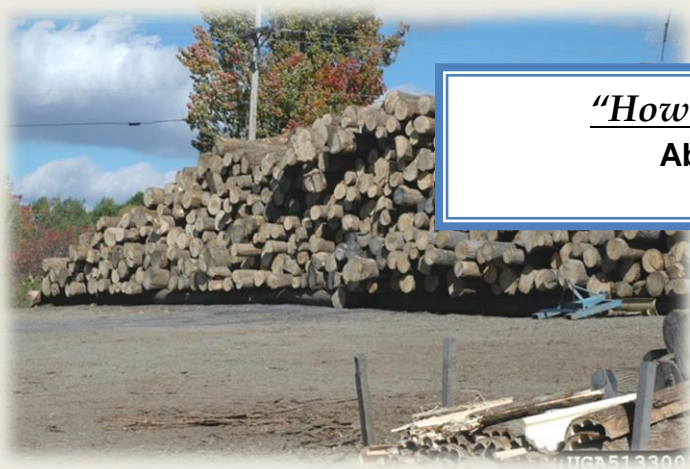
Chart 8. Average prices for cordwood and sawtimber (2008).

Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2012 dollars) by year for Wisconsin.

Product	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012	Average for all hardwoods
Cordwood (per cord)	NA	NA	NA	\$51	\$30	NA	NA	\$24	NA	\$21	\$19
Logs (per MBF scribner)	\$230	\$213	\$315	\$287	\$253	\$120	\$203	\$126	\$122	\$183	\$148

Source: Wisconsin Administrative Code Chapter NR46, 2002 to 2012. The stumpage values calculated each year are for the sole purpose of assessing MFL yield and FCL severance taxes, not for determining the price that should be received for timber.



"How much yellow birch biomass do we have?"

Aboveground carbon by region of the state

There were 10.6 million tons of aboveground [biomass](#) in live yellow birch trees in 2012, an increase of 26% from 1983. This is equivalent to approximately 5.3 million tons of carbon and represents 1.7% of all aboveground biomass statewide. As with volume, most yellow birch biomass is located in northern Wisconsin (Chart 9).

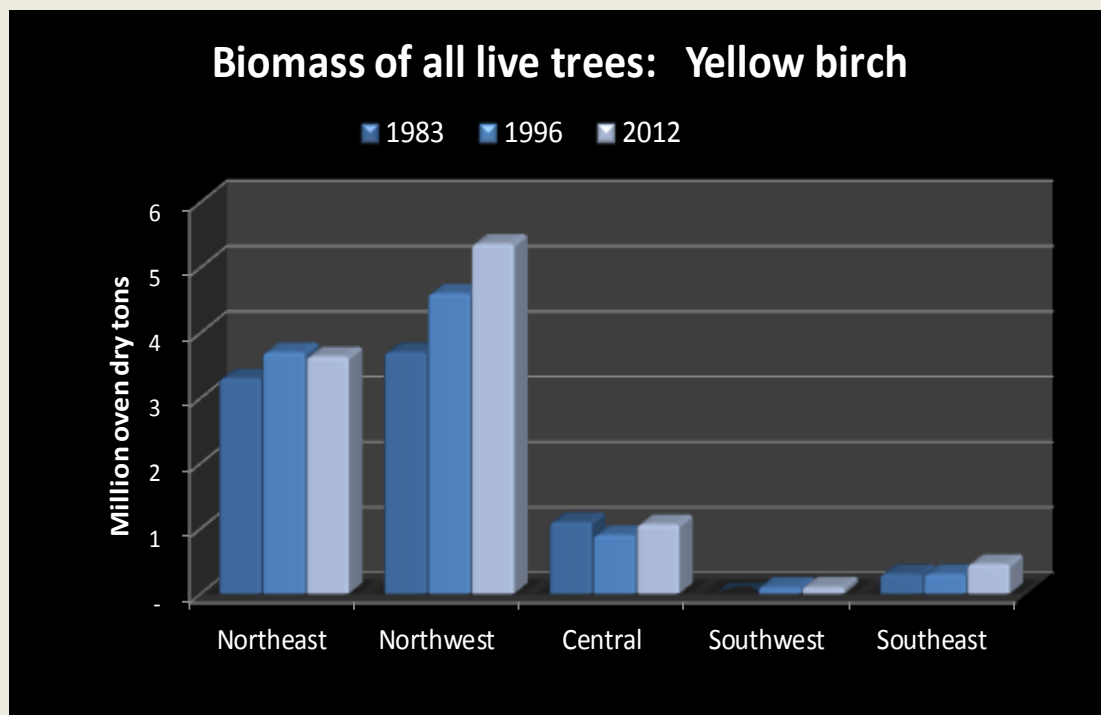


Chart 9. Biomass (above ground dry weight of live trees >1 in dbh, short tons) by year and region of the state.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

The density of yellow birch wood is higher than average with a ratio of biomass to volume of 56.7 oven-dry lbs. per cubic foot (ODP/cft). The average for all hardwoods is about 50.1 ODP/cft and for all species is 46.8 ODP/cft.

Approximately, 74.5% of all yellow birch above ground biomass is located in the main stem and 21% in the top branches.

For a table of **Biomass by County for 2012** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf>